CLAIMS

What is claimed is:

1. A method of automatically applying a quality of service treatment to a network
data flow, comprising the steps of:
   receiving a network data flow comprising at least one message element that is
   associated with an outbound quality of service treatment value;
   creating and storing an inbound quality of service value in association with
   information identifying the network data flow;
   receiving one or more inbound message elements;
   determining that the inbound message elements are associated with the same
   network data flow;
   applying the inbound quality of service value to the inbound message elements
   based on the stored information.

2. A method as recited in Claim 1, wherein receiving a network data flow comprises
receiving a network data flow comprising at least one message element that is
marked with a DSCP value and wherein applying the inbound quality of service
value comprises marking the inbound message elements with the DSCP value.

3. A method as recited in Claim 1, wherein receiving a network data flow comprises
receiving a network data flow comprising one or more message elements that are
marked with a DSCP value, and wherein applying the inbound quality of service
value comprises retrieving the inbound quality of service value from a mapping of
DSCP values to associated quality of service values, and adding the retrieved
quality of service value to the inbound message elements.

4. A method as recited in Claim 1, wherein the creating and storing step comprises
creating and storing a hash entry in a hash table that uniquely identifies the
network data flow and that includes the inbound quality of service value.

5. A method as recited in Claim 1, wherein applying the inbound quality of service
value to the inbound message elements based on the stored information comprises

23

3		automatically generating an inbound RSVP PATH message for the flow when the
4		inbound message elements include an RSVP PATH message.

1	6.	A method as recited in Claim 1, wherein receiving a network data flow comprises
2		receiving a network data flow comprising at least one message element that
3		includes an RSVP PATH message and wherein applying the inbound quality of
4		service value comprises marking the inbound message elements with an RSVP
5		PATH message.

1	7.	A router apparatus capable of routing packets of data flows in a packet-switched
2		communications network and automatically applying quality of service treatments
3		to the data flows, comprising:
4		a memory configured to store information identifying the data flows and an
5		inbound quality service value associated with each of the data flows;
6		a stored program that can access the information in the memory and which, when
7		executed by the router apparatus, carries out the steps of:
8		receiving a network data flow comprising at least one message element
9		that is associated with an outbound quality of service treatment
10		value;
11		creating and storing an inbound quality of service value in association with
12		information identifying the network data flow;
13		receiving one or more inbound message elements;
14		determining that the inbound message elements are associated with the
15		same network data flow;
16		applying the inbound quality of service value to the inbound message
17		elements based on the stored information.

1	8.	A router apparatus as recited in Claim 7, wherein the stored program step of
2		receiving a network data flow comprises receiving a network data flow comprising
3		at least one message element that is marked with a DSCP value and wherein
4		applying the inbound quality of service value comprises marking the inbound
5		message elements with the DSCP value.

1	9.	A router apparatus as recited in Claim 7, wherein the stored program step of
2		receiving a network data flow comprises receiving a network data flow comprising

24

3   one or more message elements that are marked with a DSCP value, and wherein

4   applying the inbound quality of service value comprises retrieving the inbound

5   quality of service value from a mapping of DSCP values to associated quality of

6   service values, and adding the retrieved quality of service value to the inbound

7   message elements.

1   10.   A router apparatus as recited in Claim 7, wherein the creating and storing step

2   comprises creating and storing a hash entry in a hash table that uniquely identifies

3   the network data flow and that includes the inbound quality of service value.

1   11.   A router apparatus as recited in Claim 7, wherein receiving a network data flow

2   comprises receiving a network data flow comprising at least one message element

3   that includes an RSVP PATH message and wherein applying the inbound quality

4   of service value comprises marking the inbound message elements with an RSVP

5   PATH message.

1   12.   A switch apparatus capable of switching packets of data flows in a packet-

2   switched communications network and automatically applying quality of service

3   treatments to the data flows, comprising:

4   a memory configured to store information identifying the data flows and an

5   inbound quality service value associated with each of the data flows;

6   a stored program that can access the information in the memory and which, when

7   executed by the switch apparatus, carries out the steps of:

8   receiving a network data flow comprising at least one message element

9   that is associated with an outbound quality of service treatment

10   value;

11   creating and storing an inbound quality of service value in association with

12   information identifying the network data flow;

13   receiving one or more inbound message elements;

14   determining that the inbound message elements are associated with the

15   same network data flow;

16   applying the inbound quality of service value to the inbound message

17   elements based on the stored information.

50325-098

1 13. A switch apparatus as recited in Claim 12, wherein the stored program step of
2   receiving a network data flow comprises receiving a network data flow comprising
3   at least one message element that is marked with a DSCP value and wherein
4   applying the inbound quality of service value comprises marking the inbound
5   message elements with the DSCP value.

1 14. A switch apparatus as recited in Claim 12, wherein the stored program step of
2   receiving a network data flow comprises receiving a network data flow comprising
3   one or more message elements that are marked with a DSCP value, and wherein
4   applying the inbound quality of service value comprises retrieving the inbound
5   quality of service value from a mapping of DSCP values to associated quality of
6   service values, and adding the retrieved quality of service value to the inbound
7   message elements.

1 15. A switch apparatus as recited in Claim 11, wherein the creating and storing step
2   comprises creating and storing a hash entry in a hash table that uniquely identifies
3   the network data flow and that includes the inbound quality of service value.

1 16. A switch apparatus as recited in Claim 11, wherein receiving a network data flow
2   comprises receiving a network data flow comprising at least one message element
3   that includes an RSVP PATH message and wherein applying the inbound quality
4   of service value comprises marking the inbound message elements with an RSVP
5   PATH message.

1 17. A computer-readable medium carrying one or more sequences of instructions for
2   automatically applying quality of service treatment to data flows in a
3   communications network, wherein execution of the one or more sequences of
4   instructions by one or more processors causes the one or more processors to
5   perform the steps of:
6   receiving a network data flow comprising at least one message element that is
7   associated with an outbound quality of service treatment value;
8   creating and storing an inbound quality of service value in association with
9   information identifying the network data flow;

50325-098   26

10   receiving one or more inbound message elements;

11   determining that the inbound message elements are associated with the same

12   network data flow;

13   applying the inbound quality of service value to the inbound message elements

14   based on the stored information.

1   18.   A data communications network, comprising:

2   a first end station that communicates with other end stations in the network using

3   packetized message elements;

4   a router coupled to the first end station and capable of routing the message

5   elements among the first end station and the other end stations and

6   automatically applying quality of service treatments to the data flows, and

7   comprising a memory configured to store information identifying the data

8   flows and an inbound quality service value associated with each of the data

9   flows, and a stored program that can access the information in the memory

10   and which, when executed by the router apparatus, carries out the steps of:

11   receiving a network data flow directed from one of the other end stations

12   to the first end station and comprising at least one message element

13   that is associated with an outbound quality of service treatment

14   value;

15   creating and storing an inbound quality of service value in association with

16   information identifying the network data flow;

17   receiving one or more inbound message elements;

18   determining that the inbound message elements are associated with the

19   same network data flow;

20   applying the inbound quality of service value to the inbound message

21   elements based on the stored information.

1   19.   A method of automatically applying a quality of service treatment to a network

2   data flow in a packet-switched communications network, comprising the steps of:

3   creating and storing a hash entry in a hash table of a network device that uniquely

4   identifies an inbound quality of service value in association with

5   information identifying a network data flow based on an outbound quality

6   of service value that is in at least one message element that is associated

7   with an outbound quality of service treatment value;

50325-098

1		receiving one or more inbound message elements;
2		determining that the inbound message elements are associated with the same
3		network data flow;
4		applying the inbound quality of service value to the inbound message elements
5		based on the stored information.

1	20.	A method as recited in Claim 19, wherein the network data flow comprises at least
2		one message element that is marked with a DSCP value and wherein applying the
3		inbound quality of service value comprises marking the inbound message
4		elements with the DSCP value.

1	21.	A method as recited in Claim 19, wherein the network data flow comprises one or
2		more message elements that are marked with a DSCP value, and wherein applying
3		the inbound quality of service value comprises retrieving the inbound quality of
4		service value from a mapping of DSCP values to associated quality of service
5		values, and adding the retrieved quality of service value to the inbound message
6		elements.

1	22.	A method as recited in Claim 19, wherein the network data flow comprises at least
2		one message element that includes an RSVP PATH message and wherein
3		applying the inbound quality of service value comprises marking the inbound
4		message elements with an RSVP PATH message.